The Chain Rule Homework Name _____

Find the derivative of the function.

1. $y = (3x - 2)^4$

2. $f(x) = 5(2 - x^2)^3$

3. $y = (6 + 3x)^{2/3}$

4. $f(x) = \sqrt{x + 3}$

5. $g(x) = \sqrt[3]{x^2 - 9}$

6. $y = \frac{-2}{(x^2-3x-4)^2}$

7. $f(x) = \left(\frac{3}{3-x}\right)^2$

8. $g(x) = \frac{3x}{(x+1)^3}$

9. $y = \sqrt[3]{2x^2 - 5x + 3}$

10. $h(x) = x^3(5 - 3x)^4$

11. $y = x\sqrt{1 - x^2}$

12. $y = \frac{1}{2}x^2\sqrt{4 - x^2}$

13. $f(x) = \frac{x}{\sqrt{x^2+1}}$

14. $s(t) = \left(\frac{t-3}{t^2+2}\right)^2$

15. $y = \frac{-2}{\sqrt{x}+1}$

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Find the derivative of each trigonometric function using the Chain Rule.

16. $y = \sin 3x$

17. $y = \cos^2 x$

18. $f(x) = \sin x^2$

19. $y = \cos \sqrt{x}$

20. $g(\theta) = 4 \sin^2(\pi\theta)$

21. $y = \sin(\cos 3x^2)$

Find the equation of the tangent line at the given point.

22. $y = \sqrt{x^2 + 3x + 6}$ at $(2,4)$

23. $y = (x^2 + x - 2)^2$ at $(-1, 4)$

24. $y = \sin 2x$ at $\left(\frac{\pi}{3}, -1\right)$

25. $y = (9 - x^2)^{1/3}$ at $(1, 2)$

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